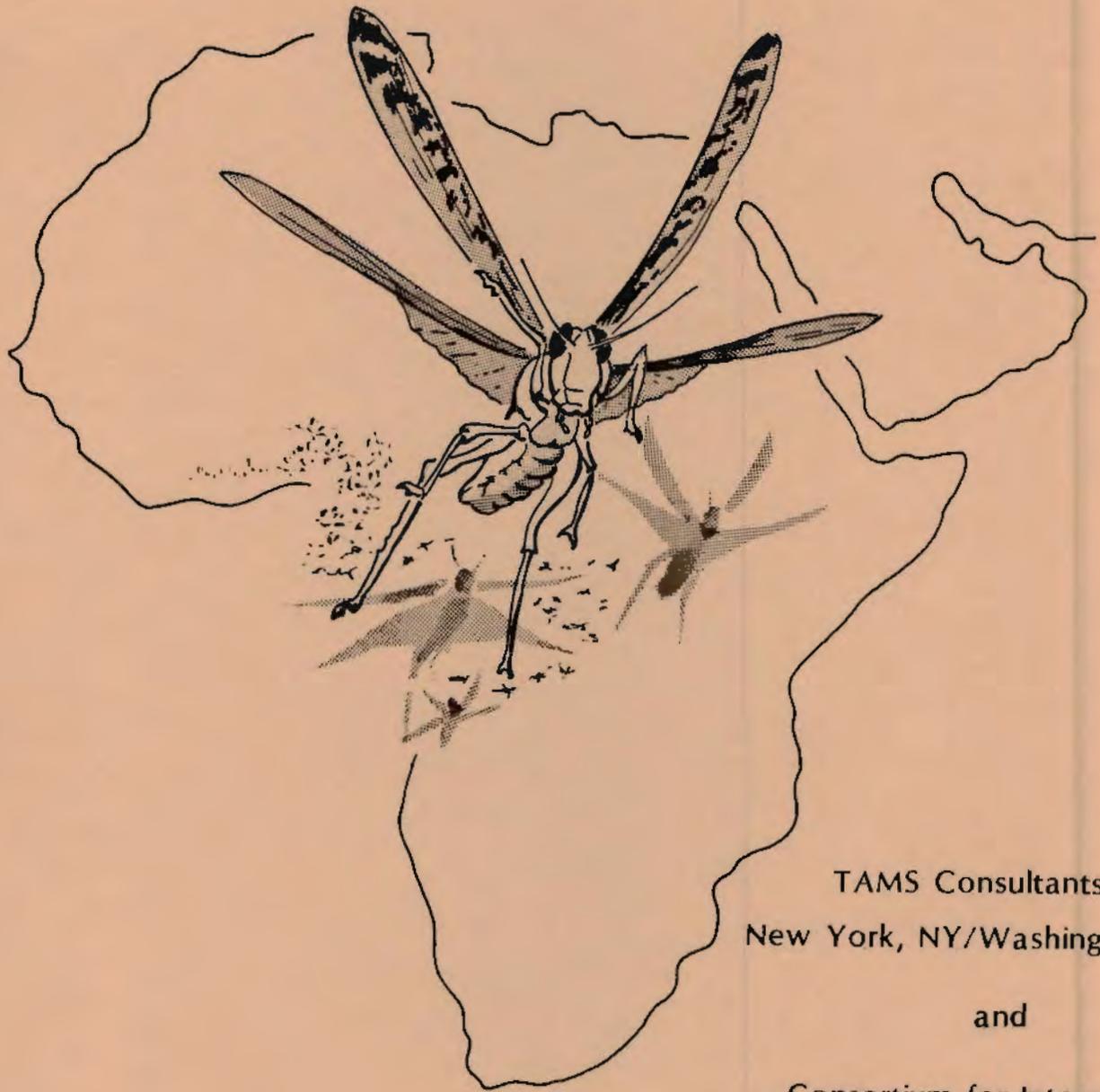


**LOCUST AND GRASSHOPPER CONTROL
IN AFRICA/ASIA**

A PROGRAMMATIC ENVIRONMENTAL ASSESSMENT

FY 1987-1 - Africa & Asia



TAMS Consultants, Inc.
New York, NY/Washington, DC

and

Consortium for International
Crop Protection
College Park, MD

PROGRESS REPORT I. SEPTEMBER 1987

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Introduction

This report summarizes progress achieved in the Programmatic Environmental Assessment of the locust and grasshopper control program in Africa/Asia during the initial months of August and September, 1987.

The programmatic EA is carried out by a team of specialists jointly provided by TAMS Consultants, Inc. of New York, NY/Washington, DC and by the Consortium for International Crop Protection (CICP) of College Park, MD.

TAMS provides its services under workorder 10 of the Indefinite Quantity Contract for Environmental Protection and Natural Resource Management, PDC-0000-I-00-4103-00.

CICP provides its services under AFR/OEO Buy-In to Contract DAN-4142-C-00-5122-00.

Summary

During this initial period the following was achieved by the TAMS/CICP team:

1. A work plan was developed.
2. Several meetings with AID staff were held for briefing and orientation, and guidance on specific issues.
3. Basic reference material was collected and work on a bibliography was started.
4. Plans and arrangements for travel were made.
5. Work was begun on an overview of the locust/grasshopper problem.

1. Work Plan

In the report period a work plan was developed for the production of the programmatic EA. The EA will be prepared by TAMS and CICIP staff as listed in Figure 1. The plan of work includes seven tasks, each resulting in a separate chapter of the EA as follows:

- A. Executive Summary
- B. Introduction
- C. The Locust/Grasshopper Problem
- D. The Locust/Grasshopper Control Problem
- E. The Environment
- F. Alternative Locust/Grasshopper Control Methods and Mitgative Action
- G. Preferred Locust/Grasshopper Control Methods

A detailed report outline is given in Annex A of this report.

The work schedule of Figure 2 shows when the various project tasks will be carried out.

FIGURE 1. TAMS/CICP TEAM MEMBERS

TAMS

Dr. J. Buursink
M. Thompson
Dr. J. Cooper
Dr. J. Sherburne
F. Peacock
to be determined

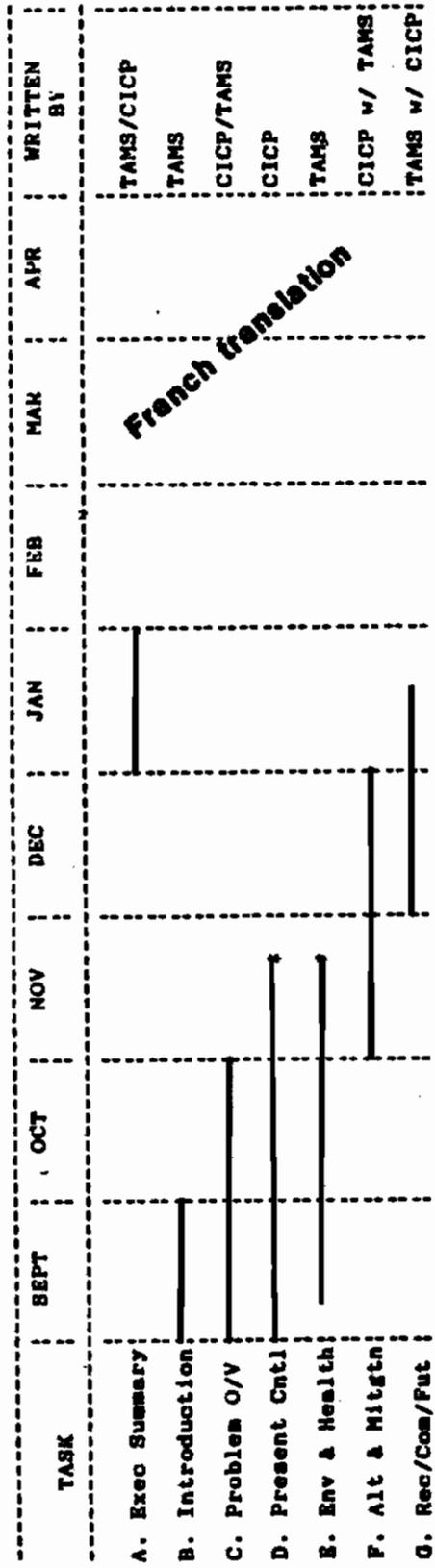
Team Leader
Deputy Team Leader (Ecologist)
Aquatic Ecologist
Terrestrial Ecologist
Natural Resource Economist
Public Health Specialist

CICP

G. Cavin
Dr. J. Cate, Jr.
Dr. P. Matteson
Dr. C. Voss
J. Jensen
Dr. V. Freed

Locust/Grasshopper Entomologist
Biocontrol Expert
Integrated Pest Management Specialist
Pesticide Application Expert
Pesticide Disposal Expert
Pesticide Impact Expert

FIGURE 2



9/1/87

* = Thankgiving

Work Schedule

2. Meetings with AID staff

Several meetings were held with AID staff for briefing and orientation as well as for guidance on specific issues.

An important orientation meeting was held at USAID on August 11. This meeting was attended by the following persons:

Stephen F. Lintner	AND/PD/ENV	202/647-8226
Harvey van Veldhuizen	Jones & Stokes	206/641-3982
Carroll W. Collier	ST/AGR/AP	703/235-2318
Tim C. Riedler	GC/CP	202/647-6381
Bob Thibeault	AID/OFDA	202/647-7558
John Buursink	TAMS	202/296-4371
G. Barrie Heinzenknecht	TAMS	212/867-1777
Frank Peacock	TAMS	202/296-4371
Jon C. Cooper	TAMS	212/867-1777
Norman Cohen	C/AID	202/647-8764
Gregory Booth	AFR/TR/ARD	202/647-9662
Kimberly Stoner	AFR/TR/ARD	202/647-5567
Dagnija Kreslins	AFR/OEO	202/647-8827
Dennis Weller	ANE/TR/ARD	202/647-4073

Subsequent meetings were held both individually and jointly with other teammates with various AID personnel involved with the locust/grasshopper problem.

As a result of these meetings several points in question were clarified and a large amount of reference materials was collected (see also para. 3). Also, the pesticides presently being used for locust/grasshopper control to be included in the EA were decided upon. These pesticides are:

1. Malathion ULV
2. Carbaryl-Sevin-4-Oil diluted with 4:1 diesel fuel
3. Fenitrothion ULV
4. Propoxur (Baygon) 1% and 2% dusts
5. Diazinon, and
6. Lindane, as liquid sprays.

In addition, 5 insecticides that are still in the testing stage will also be included. These are:

1. Bendiocarb (Ficam)
2. Chlorpyrifos (Dursban)
3. Lambda-cyhalothrin (Karate)
4. Tralomethrin (Scout)
5. Cypermethrin.

3. Collection of Reference Materials

Much of the time was spent by team members in identifying, collecting and cataloging reference materials related to locust/grasshoppers. This involved the registration of basic documentation, reviewing and sorting of information available in the offices of various AID staff, and computer card catalog searches of the USAID and USDA's libraries. A major source of information is the card file prepared by Kim Stoner.

In addition, a review was made of maps and other cartographic materials in order to identify an appropriate map scale for clear presentation of the many locust and locust habitat characteristics.

A computerized locust bibliography is being set up which includes all literature cited in the EA report as well as significant sources of information reviewed by team members but not specifically referred to.

4. Travel

Plans and arrangements were made for travel in the US and overseas. Most of the field activities were scheduled to be done in October.

Arrangements were completed for Matteson and Cate to visit the USDA Rangeland Insects Research Laboratory, Bozeman, MT. Voss and Cavin are scheduled to visit the United Kingdom, Italy, Mali, Kenya and Ethiopia. Buursink will join them in Rome for discussions with FAO. Cooper will join them in Mali, Kenya and Ethiopia and continue to Sudan and France.

It is our understanding that the recent trip made by Janice Jensen to Yemen satisfies the need for a team member to visit the Middle East.

At this time no further overseas travel is planned. At a later stage limited follow-up travel may be necessary.

Arrangements were made for scoping sessions to be held in West Africa (Bamako) and East Africa (Nairobi).

5. Environmental Assessment Report

In September work was begun with the preparation of an overview of the locust/grasshopper problem and the biology of the 6 major locust species and 3 migratory or aggregating grasshopper species considered to be of major importance in the Africa and Middle East regions.

6. Difficulties Encountered

No special difficulties were encountered during the report period.

One concern at this time is the scarcity of reliable information on the damage done by locusts and grasshoppers in Africa. Some rough cost estimates exist as to damage to crops, less information seems available on damage done to rangeland in Africa, no information seems to exist concerning damage caused to other components of the natural environment. Few economic data have so far been found which would allow for an accurate description of the impact of locust outbreaks.

7. Expenses incurred

At the end of September it is estimated that CICP's total, accumulated expenditures were approximately US \$15,000.

Expenses incurred by TAMS over August and September were approximately US \$40,000 in total.

8. Progress anticipated for October

It is expected that during October the following can be accomplished:

- review concurrent studies done by others
- complete the travel program
- at October 27 meeting all team members will meet to review work done, exchange information and to determine future course of action.

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New Braunsfel, TX 78132
512/629-2689

ANNEX A.

LOCUST/GRASSHOPPER CONTROL IN AFRICA AND ASIA

PROGRAMMATIC ENVIRONMENTAL ASSESSMENT

Detailed Report Outline

A. Executive Summary

B. Introduction

- B.1 Purpose of Assessment
- B.2 Need for Action by USAID

C. The Locust/Grasshopper Problem

- C.1 Biology of Locusts/Grasshoppers
- C.2 Geographic Distribution of Locusts/Grasshoppers
- C.3 Impact of Outbreaks on Natural Environment, Agriculture and Human Population
- C.4 Cost of Locust/Grasshopper Outbreaks

D. The Locust/Grasshopper Control Problem

- D.1 Current Locust/Grasshopper Control Practices
- D.2 Status of Survey, Forecasting, Early Warning and Reporting Systems
- D.3 Review of the Pesticides Used, Amounts, and Methods of Application in Control Programs by Country and Species
- D.4 Review of Non-chemical Control Practices
- D.5 Policies Concerning Locust/Grasshopper Control Programs
 - D.5.1 International Donors
 - D.5.2 Regional Organizations
 - D.5.3 Affected Countries
- D.6 Use of Forecasting and Survey Information in the Planning and Management of Control Programs
- D.7 Use of the Early Warning System in the Planning of Control Programs
- D.8 Cost of Locust/Grasshopper Control
- D.9 Need for Improved Locust/Grasshopper Control Procedures
 - D.9.1 Timing of Treatment
 - D.9.1.1 Developmental Stage of Insect
 - D.9.1.2 Population Growth and Gregarization
 - D.9.1.3 Phenological Stage of Host Plants
 - D.9.2 Selection of Areas for Treatment
 - D.9.2.1 Early Treatment of:
 1. Known Breeding Areas Identified by Surveys (Desert Locust)
 2. Populations in Non-Cultivated Areas With Successful Breeding Potential

- 3. Populations in Lands at the Margins of Agricultural Cultivation with Successful Breeding Potential
- 4. Populations in Cultivated Areas With Successful Breeding Potential
- D.9.2.2 Treatment Following Large-Scale Outbreaks of:
 - 1. Desert Locust Swarms While in Flight
 - 2. Moving Locust Bands with Aerial and Ground Application
 - 3. Populations in Non-Cultivated Areas With Aerial and Ground Application
 - 4. Populations in Lands at the Margins of Agricultural Cultivation With Aerial and Ground Application
 - 5. Populations in Cultivated Areas with Aerial and Ground Application
- D.9.3 Selection of Pesticides
 - D.9.3.1 Review of the Types of Insecticides Proposed for Use in Control Programs
 - 1. International Registration Status
 - 2. U.S. Environmental Protection Agency Status
 - D.9.3.2 The Basis for Selection of Pesticides Proposed for the Control Program
 - D.9.3.3 The Extent to Which the Proposed Control Program is Part of an Integrated Pest Management Program
- D.9.4 Application of Pesticides
- D.9.5 Evaluation of Effectiveness of Pesticides and Potential Environmental Impacts
 - D.9.5.1 Review of Potential Acute and Long-term Toxicological Hazards, Either Human or Environmental, Associated With the Proposed Control Program
 - D.9.5.2 The Effectiveness of the Proposed Pesticides for the Control of Locusts and Grasshoppers
 - D.9.5.3 Compatibility of the Pesticides Proposed for Use with Target and Non-target Ecosystems
 - D.9.5.4 The availability of effectiveness of Nonchemical Control Methods
- D.9.6 Management of Pesticides
 - D.9.6.1 Prepositioning and Storage of Pesticides
 - D.9.6.2 Distribution of Insecticides
 - D.9.6.3 Health Monitoring of Personnel
 - D.9.6.4 Emergency Preparations
 - D.9.6.5 Disposal of Pesticide Containers
- D.9.7 Training of Applicators
 - D.9.7.1 Ground Application
 - D.9.7.2 Aerial Application

- D.9.7.3 Personnel in Storage and Transport Facilities
- D.9.8 Monitoring of Pesticides
- D.9.10 Donor Coordination

E. The Environment

E.1 Description of Primary Control Program Areas

- E.1.1 West Africa
 - E.1.1.1 Climate
 - E.1.1.2 Terrestrial Ecosystems
 - o Soils
 - o Plant Life
 - o Animal Life
 - E.1.1.3 Aquatic Ecosystems
 - o Sediments
 - o Plant Life
 - o Animal Life
 - E.1.1.4 Rare and Endangered Species and Their Critical Habitat
 - E.1.1.5 Agricultural Systems
 - E.1.1.6 Human Settlement Patterns
 - E.1.1.7 Human Health Standards
 - E.1.1.8 Human Exposure to Pesticides
 - E.1.1.9 Pesticide Use for Agricultural and Public Health Purposes

- E.1.2 East Africa
- E.1.3 Southern Africa

E.2 Description of Potential Secondary Control Areas

- E.2.1 North Africa
- E.2.2 Arabian Peninsula
- E.2.3 South Asia

E.3 Environmental Consequences of Pesticide Use

- E.3.1 Terrestrial Ecosystems
 - E.3.1.1 Soils
 - E.3.1.2 Plant Life
 - E.3.1.3 Animal Life
- E.3.2 Aquatic Ecosystems
 - E.3.2.1 Sediments
 - E.3.2.2 Plant Life
 - E.3.2.3 Animal Life
- E.3.3 Rare and Endangered Species and Their Critical Habitat
- E.3.4 Agricultural Systems
- E.3.5 Human Settlement Patterns
- E.3.6 Human Health Standards
- E.3.7 Human Exposure to Pesticides
- E.3.8 Interaction with Pesticides Used for Agricultural and Public Health Purposes

F. Alternative Locust/Grasshopper Control
Methods and Mitigative Action

F.1 Control Methods

- F.1.1 Short-term, Medium-term, and Long-term Alternatives
- F.1.2 Alternative A -- No Action
- F.1.3 Alternative B -- Conditional No Action
- F.1.4 Alternative C -- Provision of Food Assistance vs. Pest Control
- F.1.5 Alternative D -- Improved Forecasting and Early Control
- F.1.6 Alternative E -- Integrated Pest Management
- F.1.7 Alternative F -- Biological Control
- F.1.8 Alternative G -- Multiple Intervention Strategy

F.2 Proposed Mitigation Actions

- F.2.1 Policies Concerning Locust/Grasshopper Control Programs
- F.2.2 Use of Forecasting and Survey Information in the Planning and Management of Control Programs
- F.2.3 Use of the Early Warning System in the Planning of Control Programs
- F.2.4 Selection of Areas for Treatment
- F.2.5 Selection of Pesticides and Quality Control of Pesticide Formulations
- F.2.6 Procedures for Application of Pesticides
- F.2.7 Procedures for Identification of Appropriate Application Equipment
- F.2.8 Evaluation of Effectiveness of Pesticides
- F.2.9 Potential Environmental Impacts
- F.2.10 Importation of Pesticides
- F.2.11 Transportation of Pesticides
- F.2.12 Storage of Pesticides
- F.2.13 Disposal of Pesticides and Containers
- F.2.14 Training of Applicators
- F.2.15 Monitoring of Pesticide Residues
- F.2.16 Monitoring of Pesticide Effects
- F.2.17 Monitoring of Pesticide Exposure
- F.2.18 Donor Coordination
- F.2.19 Identification of Short and Long Term Institutional Development Needs
- F.2.20 Identification of Short and Long Term Training Needs
- F.2.21 Identification of Short and Long Term Research Needs

G. Preferred Locust/Grasshopper Control Methods

- G.1 Technical Analysis
- G.2 Institutional Analysis
- G.3 Economic Analysis

H. Recommendations